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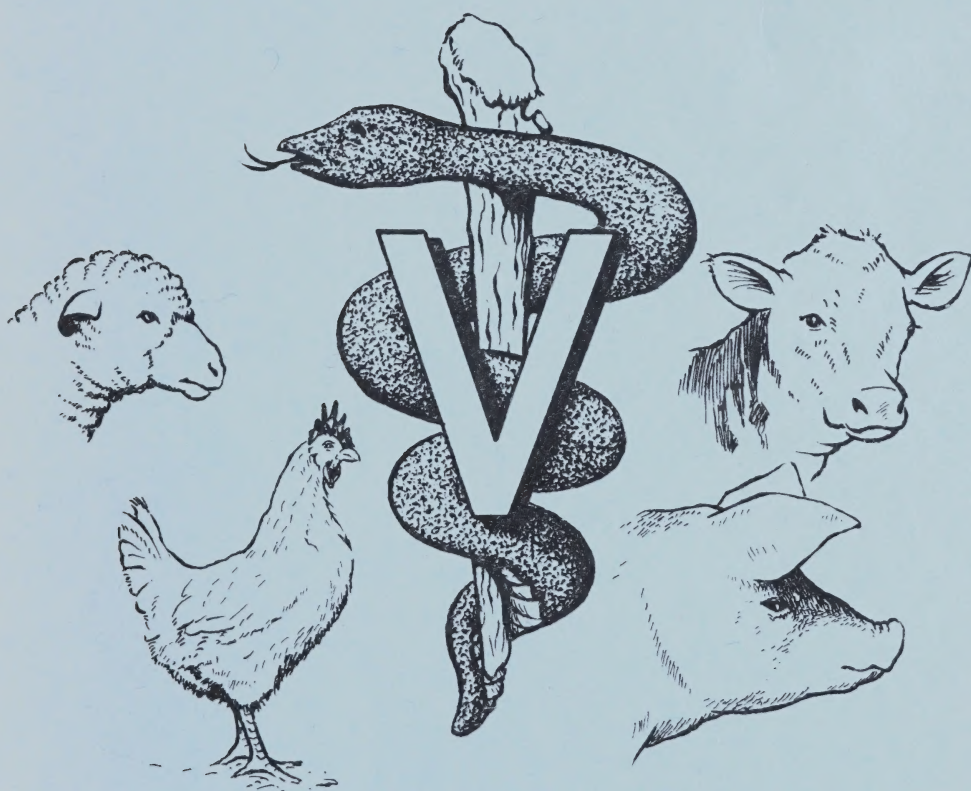
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*Welcome to the*

# *International Animal Disease Center*



*Ames, Iowa*

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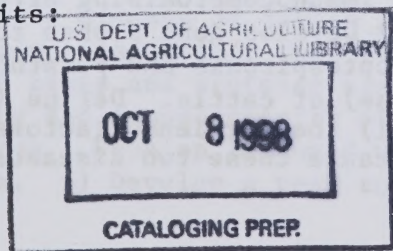


## WELCOME TO THE NATIONAL ANIMAL DISEASE CENTER

The National Animal Disease Center (NADC) of the Agricultural Research Service (ARS), is the major United States Department of Agriculture (USDA) research center for investigation of livestock and poultry diseases that occur in the United States.

The mission of this Center is to conduct basic and applied research that will produce the knowledge and technology required to control selected economically important infectious and noninfectious diseases of domestic animals. Investigation of each disease entity is conducted by a team of scientists who have specialized training in different disciplines. We plan to solve many of the perplexing problems associated with disease processes by this team approach. Although we have considerable knowledge about specific diseases, there is much more to learn about the mechanisms of susceptibility and immunity in the host, course of events in the development of pathological processes, virulence and invasiveness of the infectious agents, and intermediary metabolism of the healthy and diseased host. Knowledge of this type is essential for the development of effective animal disease control programs.

Scientific disciplines represented at the Center are Veterinary Medicine, Microbiology, Immunology, Virology, Bacteriology, Pathology, Physiology, and Biochemistry. At the present time, the Center has more than 30 specific research projects. These projects are organized administratively into seven Research Units:



Brucellosis Research - George Lambert, Research Leader

The objectives of this Unit are to: 1) Develop improved diagnostic tests for detecting *Brucella* infected cattle. 2) Develop an improved vaccine for the control of brucellosis in cattle. 3) Increase knowledge of the epidemiology and pathogenesis of brucellosis.

Mineral Metabolism and Mastitis Research - Ronald Horst, Research Leader

The objectives of this Unit are to: 1) Define, at the molecular level, the regulatory mechanisms involved in calcium metabolism, nutritional immunity and mucosal immunity in cattle. 2) Apply knowledge of these regulatory mechanisms through the development of methods to prevent milk fever of cattle, and enhance the immunity of the bovine mammary gland and calf intestinal tract to infection.

Pathology Research Unit - Norman Cheville, Research Leader

The objectives of this Unit are to: 1) Develop an effective means for vaccinating poultry against fowl cholera and define the mechanisms by which *Pasteurella* cause this disease. 2) Define the mechanisms by which *pasteurella* toxins cause atrophic rhinitis in swine. 3) Improve diagnostic tests for psittacosis through genetic analysis of avian and mammalian isolates of *Chlamydia psittaci* and developing monoclonal antibodies to selected epitopes of these agents. 4) Develop a vaccine against aspergillosis of turkeys and define the immunocompromising effects of mycotoxins. 5) Develop gene probes for the diagnosis of leptospirosis and paratuberculosis (Johne's disease) of cattle. Define (at the molecular level) the virulence factors of the bacteria that cause these two diseases.

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### Physiopathology - Shannon Whipp, Research Leader

The objectives of this Unit are to: 1) Define the mechanisms by which the microbial flora of the rumen detoxifies poisonous plants such as halogeton, Leucena leucocephala, and Lathyrus sylvestra. 2) Develop means to prevent colibacillosis in postweaning swine and define the mechanisms by which Escherichia coli cause this disease. 3) Define the mechanisms by which Treponema hyodysenteriae causes swine dysentery and improve the diagnostic tests for this agent. 4) Develop improved techniques for detecting Listeria monocytogenes and Campylobacter spp in food. 5) Define the mechanisms by which Salmonella spp exist in the carrier state in healthy swine.

### Respiratory Disease research - Randall Cutlip, Research Leader

The objectives of this unit are to: 1) Define the mechanisms by which viruses, and bacteria interact to cause pneumonia in cattle and sheep. 2) Identify the attributes that enable some types of Pasteurella hemolytica to intensively colonize the respiratory tract of cattle. 3) Identify antigens of lentiviruses, adenoviruses, paramyxoviruses, Corynebacterium and Pasteurella that can be used in diagnostic tests and vaccines to control pneumonia in cattle and sheep. 4) Determine what types of vaccine delivery vehicles most effectively stimulate mucosal immunity in the respiratory tracts of ruminants.

### Virology Cattle - Janice Miller, Research Leader

The objectives of this Unit are to: 1) Determine the role of infectious bovine rhinotracheitis virus in reproductive disease of cattle and develop improved immunogens against this virus. 2) Identify the genes and proteins associated with pathogenicity and immunogenicity of bovine virus diarrhea virus. Develop improved vaccines against this disease. 3) Develop a test to identify cattle

infected with bovine lentivirus. Determine the prevalence of lentivirus among U.S. cattle and pathogenicity of bovine lentivirus.

#### Virology Swine - William Mengeling, Research Leader

The objectives of this Unit are to: 1) Identify the protective antigens of the transmissible gastroenteritis virus and develop means to use them in an effective vaccine. 2) Define the molecular genetics of the latent state of pseudorabies virus infection in swine, and identify the genetic changes that occur in recrudescence from this latent state. 3) Determine the role of cell mediated immunity in protection against pseudorabies in swine. 4) Define the role of viruses in reproductive failure in swine. 5) Compare the DNA sequences and major proteins of porcine, sea-lion and feline caliciviruses. Develop methods to differentiate among caliciviruses of vesicular disease.

It is inevitable that the type of research and the diseases to be investigated will change continuously. Changes, most likely, will be associated with the development of new knowledge and techniques within each scientific discipline, the appearance of new diseases, emergence of old diseases as national problems because of changes in management or technology, and congressionally mandated changes in national priorities.

The Center is adding to the foundation of biomedical knowledge and technology on diseases of animals that, over the years, will show continued growth and, thus, be a resource of increasing value to the livestock industry and the general public of this country.

HARLEY W. MOON  
Director





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